

THE JOHN D. FREEMAN HERBARIUM (AUA): A HISTORY AND CATALOGUE OF VASCULAR PLANT TYPE SPECIMENS

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ABSTRACT

The John D. Freeman Herbarium at Auburn University can trace its roots almost back to the foundation of the institution itself in 1856. By 1867 the campus boasted a natural history museum that housed botanical collections. This was most likely the first organized herbarium at Auburn University. Such notable former faculty as F.S. Earle, L.M. Underwood and especially P.H. Mell, Jr., surmounted early challenges, including a destructive fire in 1887, to establish and maintain a herbarium collection. By 1901, the herbarium housed over 40,000 specimens, including important collections from A.H. Curtiss, G.W. Carver, A.B. Langlois, and J. Darby. Tragically, the herbarium was again destroyed by fire in 1920. Despite this, AUA again emerged from the ashes to reestablish itself as an important state and regional herbarium. Growth at AUA from 1968–1995 was due to the efforts of the late John D. Freeman, who took the herbarium from obscurity to national recognition and quintupled the number of holdings during his tenure. The Freeman Herbarium now contains over 60,000 sheets and is one of the largest and most modern collections in Alabama. The herbarium currently houses 26 documented vascular plant type specimens that are catalogued.

RESUMEN

El Herbario John D. Freeman de la Universidad de Auburn puede rastrear sus raíces desde la fundación de la universidad en 1856. En 1867 la ciudad universitaria disfrutaba ya de un museo de historia natural que albergaba colecciones botánicas. Es probable que éste no fuese el primer herbario organizado que tuvo la Universidad de Auburn. Los primeros profesores destacables como F.S. Earle, L.M. Underwood, y especialmente, P.H. Mell, Jr., vencieron desafíos tempranos, incluso un incendio destructivo en 1887, que perjudicó el mantenimiento de la colección del herbario. En 1901, el herbario albergaba más de 40,000 especies, incluyendo colecciones importantes de A.H. Curtiss, G.W. Carver, A.B. Langlois, y J. Darby. Trágicamente, el herbario fue destruido una vez más por un incendio en 1920. A pesar de la segunda tragedia, el herbario volvió a surgir de las cenizas para restablecerse como uno de los herbarios más importantes del estado y de la región. El crecimiento del herbario desde los años 1968–1995, fue debido a los esfuerzos del ex-curador John D. Freeman, quien tomó el herbario desde sus penumbras hasta ser nacionalmente reconocido y quintuplicó el número de colecciones durante su periodo como curador. Actualmente el herbario John D. Freeman cuenta con más de 60,000 ejemplares y es uno de los herbarios más grandes y modernos del estado de Alabama. Hasta la fecha el herbario alberga 26 ejemplares tipo de plantas vasculares documentadas que están propiamente enumeradas y catalogadas.

HISTORY

The early history of the John D. Freeman Herbarium can be traced back almost to the foundation of Auburn University itself, and was directly affected by the challenges of establishing an institution of higher education in the late 1850s. Auburn University was originally chartered in 1856 as the East Alabama Male College (EAMC), a Methodist college that officially opened its doors to students in 1859 (Yeager & Stevenson 2000). Botany was the only life science course offered at the college and was first taught by John Darby, A.M., the “Julia Ann Hamiter” Professor of Natural Science (Davis 1992). Darby was a botanist, chemist, and author of one of the earliest floristic works to focus on the southern United States (Darby 1857). This work was intended as a botanical textbook for college and high school students throughout the South and was surely used in Darby’s own curriculum, along with other botanical texts by Gray and Chapman. While there is no evidence that an official herbarium collection existed in 1859, Darby no doubt had a set of pressed and dried botanical specimens which he used for teaching botany and plant identification.

Botany continued to be taught until 1861 when EAMC was closed due to the Civil War, in which many of the faculty and students entered the Confederate service (Draughon 1954). The Old Main building, predecessor to current-day Samford Hall, served as a Confederate hospital from 1864–1866 (Yeager & Stevenson 2000). In 1866, the college reopened and Darby was again elected to teach botany (Minutes July 9, 1866). Darby was given emeritus status in 1869 but continued to be listed as a faculty member until 1871. In the 1867 catalogue of the EAMC it lists a “museum which is now being formed” as one of the assets and student recruiting points of the college. This museum housed plants, minerals, fossils, insects, mammals, and Indian relics, among other items. Darby was involved with the college museum and most likely organized the first herbarium collection at Auburn in the late 1860s.

A depressed, post-Civil War economy led to serious financial difficulties that plagued the college during the Reconstruction Period. In 1872, after much debate and considerable objection, the Board of Directors (later Board of Trustees) transferred the EAMC property and buildings to the state of Alabama to establish a land grant college under the provisions of the Morrill Land Grant Act passed by Congress in 1862 (Draughon 1954; Yeager & Stevenson 2000). This act, extended to former Confederate States after the Civil War and ratified by the Alabama Legislature in 1867, provided 30,000 acres of public land for each senator and representative of a state as an endowment to establish a college with the goal “to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life” (Draughon 1954). In 1872, the college was officially named the Agricultural and Mechanical College of

Alabama (A & M College) and the herbarium became an integral part of Agricultural Experiment Station work.

Along with the change from church-college to state-college came changes in administration and some faculty members. In this turbulent time, J.B. Read was selected as the first Professor of Natural Sciences, which included the responsibility of teaching botany. However, his tenure was cut short, when after only eight months the Board of Directors reduced the number of faculty from eight to six, presumably for financial reasons. For the next three years the professorship of Natural Sciences was given to William C. Stubbs, a chemist. However Stubbs, who already taught chemistry, mineralogy and geology, probably did not take on the added responsibility of teaching botany. There are indications that in 1876 botany classes were taught by Professor of Agriculture and President of the young A & M College, Isaac T. Tichenor (botany classes were required by the School of Agriculture course of study according to the early and mid-1870s course catalogues [Yeager & Stevenson 2000]). In 1877, the Board of Trustees hired E.Q. Thornton as Professor of Natural Sciences, but his tenure lasted less than one year due to his unexpected death (Yeager & Stevenson 2000).

Finally, in 1878 the Trustees hired the talented Patrick H. Mell, Jr. to be Professor of Natural Science (Yeager & Stevenson 2000). Under Mell's direction and leadership the college museum holdings were greatly expanded through acquisition of specimens via purchases, exchanges with other institutions, and donations from private collectors and citizens. During Mell's tenure we find the first documentation of the actual size of the herbarium. Reporting for the 1881–1882 school year, Mell stated that the museum had increased in botanical collections from 266 to 1577 (Mell 1882). The following year he reported an increase of 442 botanical specimens for a grand total of 2019 (Mell 1883).

Tragically, in 1887, the herbarium was destroyed when Old Main caught fire and burned. While the number of collections destroyed isn't known, the herbarium was indeed important and growing under Mell's direction. He described his work and the condition of the herbarium prior to the fire as follows:

“It was my pleasure to begin the preparation of this Botany of Alabama prior to 1887 but the destruction of the Museum by fire that year lost the Institution a valuable herbarium rich in plants collected from Alabama by Prof. Darby, Prof. Thornton, Prof. Stubbs and myself” (Annual Report 1896).

Despite the destruction of the herbarium, Mell published a list of cultivated grasses in Alabama which included the first attempt to list all the grasses that occurred in state (Mell 1889). Prior to the fire, Mell began compiling and writing the first flora of Alabama, to be issued in sections as they were completed (Mell 1896). He was finally able to publish one section of his flora but, unfortunately, no other sections were ever completed (Mell 1896). Incidentally, Charles

T. Mohr, who was concurrently writing his own Alabama flora, considered Mell an upstart in the business of writing the flora of Alabama, and felt threatened by his efforts (Davenport 1979).

Mell's talents were not limited to teaching botany and directing museum collections. Along with these responsibilities, he also served as the first Director of the Alabama Weather Service from 1884–1893, an agency that he created. He developed a system of flag signals used to relay weather conditions and forecasts around the state, a system that was soon adopted by the National Weather Service (Yeager & Stevenson 2000). Later, Mell declined to have his name submitted to President Grover Cleveland to become Chief of the U.S. Weather Bureau (see Mell Scrapbooks 1891–1906, Auburn Univ. Archives). In 1891, he was also appointed Director of the Alabama Experiment Station where he served until 1902 (Yeager & Stevenson 2000). In 1896, Mell was elected Chairman of the Section of Botany and Horticulture of the American Association of Agricultural Colleges and Experiment Stations (Anonymous 1899). After turning down other prestigious offers, including the presidency of Mercer University, Mell finally resigned from Auburn in 1902 to accept the presidency of Clemson College in South Carolina (Kerr 1985).

In late 1895, Lucien M. Underwood came to Auburn as a biologist and began working immediately on the “fungous flora of Alabama, since comparatively little is known of the extent and character of the rich cryptogamic flora of Alabama” (Annual Report 1896). Underwood departed after only one year but not before collecting a great deal and publishing a treatise on edible fungi (Underwood 1896).

Frank S. Earle succeeded Underwood and served as biologist and horticulturist. Earle finished the final preparations on Underwood's “fungous flora of Alabama” and in 1897 published their list of Alabama fungi with Underwood as lead author (Underwood & Earle 1897). This list enumerated over 1100 species of fungi known to occur in Alabama at the time. Also noted was the fact that the college at Auburn was the only institution in the state that maintained a course in botany. They also described some of the collectors and collections in the herbarium at that time (Underwood & Earle 1897). Earle later provided this list of fungi to Charles T. Mohr who included it in the fungi section of his monumental work on the flora of Alabama (Mohr 1901). Earle also studied and collected vascular plants from the unique habitats on and surrounding the metamorphic or granite outcrop regions of eastern Alabama (Earle 1902).

Earle provided excellent documentation of the growth and composition of the herbarium collections from 1896 to 1900. Indications are that Mell's administrative duties kept him away from the herbarium and that by the turn of the 20th century Earle was essentially managing the herbarium. On January 1, 1901, Earle reported the following numbers and composition of the herbarium (Annual Report 1901):

Flowering Plants, etc.	20,606
Fungi	16,950
Lichens	1,006
Mosses, etc	588
Algae	984
TOTAL	40,134

Considering that the herbarium burned in 1887 that was an impressive accumulation of specimens in 13 years.

Earle left Auburn in 1901 and was replaced by Edwin M. Wilcox, Professor of Botany, and self-described "Vegetable Physiologist and Pathologist" (Annual Report 1901). Wilcox was the department head and taught botany classes from 1902-1908. After he arrived, Wilcox immediately began preparing what amounted to the first plant atlas for the state of Alabama. He began a card index of all the plants, including a county map of the state pinpointing each collection location (Annual Report 1902). It is doubtful the project was ever completed because during his six-year tenure Wilcox only referred to the herbarium twice in his annual reports. Other than beginning the plant indexing project, Wilcox's only other reference to the herbarium was a request to get modern cases to hold and preserve the collections (Annual Report 1904). While Wilcox made some strides in maintaining the herbarium, no further reports documenting the size and growth of the herbarium exist after 1901. Most of Wilcox's time was spent working as a plant pathologist, not herbarium curator.

Francis E. Lloyd replaced Wilcox in 1908 as Professor of Botany. The herbarium was apparently poorly maintained and had fallen into disuse during Wilcox's tenure. In Lloyd's first report to the president he stated that, "Steps have been taken toward...the rehabilitation of the herbarium" which, he continues, "is of paramount importance for Experiment Station work as a source of information in matters pertaining to the flora of this section of the country" (Annual Report 1908). Despite Lloyd's emphasis on the importance and necessity of the herbarium, not much was accomplished during his first year. The next year, Lloyd again stressed the need to put the herbarium "into shape for use" (Annual Report 1909). Furthermore, Wilcox's 1904 request for modern herbarium cases must have gone unfulfilled because in 1909 Lloyd stated that the greatest need for the herbarium "is proper housing in the form of tightly constructed cases, since without these we cannot control the insect pests which are peculiarly bothersome here" (Annual Report 1909).

After 1909, little documentation is found relating to the herbarium. It is well known, however, that by 1910 the Botany Department (and herbarium), along with many other life science departments, had moved to a new building on campus. According to the 1910 bulletin, "A handsome and commodious building has been erected for the departments of (1) agriculture, (2) horticultural

ture, (3) botany, (4) entomology, and (5) animal husbandry" (Davis 1992). Furthermore, this building, named Comer Hall, was "thought to be superior or equal to any building in the south" (Yeager & Stevenson 2000). By 1918, the Botany Department occupied the western half of the third floor of Comer Hall. Incredibly, the herbarium was again completely destroyed by flames when a fire engulfed and gutted Comer Hall in October 1920! The total number of specimens lost in this fire is unknown, but by extrapolating from Earle's 1901 report of 40,134 total specimens, an estimate of greater than 50,000 specimens destroyed would be conservative.

The composition of the herbarium before the Comer Hall fire is fairly well documented, at least through the year 1900. The following is a list of some of the valuable collections known to have existed in the herbarium prior to the fire of 1920. Beyond simple documentation, this list serves only to sharpen the tragedy of the loss. First and foremost, the losses included important historical and scientific collections by G.F. Atkinson, C.F. Baker, G.W. Carver, J. Darby, J.F. Duggar, F.S. Earle, A.B. Langlois, P.H. Mell, Jr., W.C. Stubbs, E.Q. Thornton, L.M. Underwood, and an entire set of collections documenting A.H. Curtiss' work on the flora of Florida. Additionally, a large collection of Alabama grasses, an ample seed collection, and 500 exchange specimens from Liverpool, England were also consumed in the blaze. Finally, the loss of documentation for Mell's work on the Flora of Alabama, as well as many other research projects, was especially disappointing (Davis 1992). Other departments that were partially or completely destroyed included Agronomy, Plant Breeding, Soils, Plant Pathology, Horticulture, Animal Husbandry, Entomology, and the administrative offices (Annual Report 1921). The Comer Hall fire was a monumental loss in the history of the herbarium and Auburn University. However, unlike Comer Hall, which was rebuilt in two years, it took many decades to rebuild the herbarium.

While the herbarium was indeed reestablished, there is little information regarding its growth during the years following the fire. In the 1950s, the heirs of Elizabeth F. Andrews, a botanist and author, donated her personal collection of about 2500 plants to the herbarium which included collections by A.W. Chapman. This donation formed the nucleus for further rebuilding efforts. Donald E. Davis, Professor of Botany, came to Auburn in the late 1940s and served as herbarium curator for a time. Davis' students in plant taxonomy and weed science were required to submit specimens and thereby added many collections to the herbarium from 1947-1968 (Davis 1992). Other taxonomists in the botany department during the 1950s and 1960s included Edward T. Browne, Jr. and Alfred C. Koelling (Don Davis, pers. comm.). Browne came to Auburn in 1956 and was herbarium curator until about 1960. The herbarium grew very little during his short tenure, but herbarium records do indicate there was an exchange agreement with the University of Georgia. Browne himself only added about two dozen of his personal collections to the herbarium. Later, Koelling served

as herbarium curator from 1964–1967. In efforts to increase herbarium holdings, Koelling initiated a number of exchanges with other institutions and also added over 750 of his own collections. Herbarium growth from 1922 to 1968 was modest, but by 1968 the herbarium contained a total of 11,300 sheets (Davis 1992).

Herbarium growth from 1968–1995 was due to the efforts of the late John D. Freeman, who emphasized the importance of fieldwork and collecting, and that the herbarium was an essential and valuable botanical research tool. He initiated exchange programs with many institutions and was active in loaning specimens out to various researchers. Freeman directed several graduate student research studies that helped document the flora and assess plant distributions in critical areas throughout the state. These types of studies led to active collecting efforts and, in turn, added greatly to the herbarium holdings. Undergraduate students who took Freeman's systematic botany courses can testify to the emphasis he placed on collecting. His students were required to turn in large collections of 150–200 plants — pressed, identified and labeled — at the conclusion of the course. That amount of collecting kept exchange programs bolstered and greatly enlarged the herbarium holdings. In 1974, Freeman summarized the growth of the herbarium during his first five years at Auburn as follows (Freeman 1974):

Year	Specimens mounted and shelved
1969	3,357
1970	3,737
1971	3,640
1972	2,100
1973	1,420
Total	14,254
Cumulative through 1968	11,300
Present holdings	25,554

Over his career, Freeman took the herbarium from relative obscurity to national recognition. In 1974, the Advisory Committee for Systematic Resources in Botany (1974) selected the Auburn University Herbarium as a National Resource Collection, a collection considered vital for continued science support and research. This designation was given to only 105 (out of a total of 1127) institutions nationwide. Freeman's personal research interests likewise garnered national attention as he focused on the genus *Trillium*. He collected *Trillium* from all across the United States and Japan, naming seven new species including the federally listed southeastern endemic *Trillium reliquum*.

Prior to his death, Freeman helped negotiate the acquisition of the herbarium collection at St. Bernard College (SB) in Cullman County, Alabama. This

invaluable, historic collection of about 5000 sheets was the personal herbarium of Wolfgang Wolf, a prolific botanist in the early 20th century and lay brother of the Order of Saint Benedict. This collection contains not only Alabama plants but also many collections from around the eastern United States and Europe. This acquisition added greatly to the holdings of the Freeman Herbarium and pushed the number of total collections to over 60,000. Ultimately, Freeman increased the number of mounted specimens five-fold in 27 years. In January 1998, the Board of Trustees, in recognition of his enormous botanical contributions, unanimously passed a resolution officially naming the Auburn University Herbarium in honor of Dr. John D. Freeman.

With no permanent curator in place after 1995, activity at the Freeman Herbarium dropped dramatically. For the next three years Jerome Ward, a visiting assistant professor, supervised herbarium activity on a part-time basis and, with the help of students, began the long process of organizing and incorporating the St. Bernard collection.

From 1998 to 2002, Cynthia M. Morton held the post of plant taxonomist and director of the Freeman Herbarium, and in 1999 the author was hired as curator. Under Morton's direction the Freeman Herbarium was brought back to full activity with the resumption of many exchange agreements and increased loan activity. The collections were refolded using archival quality genus covers, updated taxonomically, and organized geographically. Many misfiled collections were found and duplicate collections removed, which greatly relieved limited cabinet space. Another major emphasis during this time was to have the label information from each specimen entered into a computer database. With the help of students and support from the State Lands Division of the Alabama Natural Heritage Program, this project was completed in 2002. The database is maintained as new specimens are accessioned and added to the collection and is available via the World Wide Web at <http://www.auburn.edu/herbarium>. The effort to database the herbarium collection has led to the publication of a checklist of Alabama plants compiled from the combined information of the Freeman Herbarium and University of Alabama Herbarium (UNA) (Morton et al. 2002).

The Freeman Herbarium is now one of the largest collections in Alabama and is a vital resource for various natural science departments at Auburn University including the Agricultural Experiment Station, Biological Sciences, Entomology & Plant Pathology, Forestry, Horticulture, Pharmacy, Veterinary Medicine, and Wildlife. The Freeman Herbarium is used throughout the region by other colleges, universities, private companies, and government agencies, and serves as the state herbarium (Alabama Code §1-2-12). The collection houses valuable historic specimens that date to the late 19th and early 20th centuries, including many by E.F. Andrews, A.W. Chapman, and W. Wolf with the earliest collections dating to the 1840s. More recent contributors who have added im-

portant collections to the Freeman Herbarium include V.E. Crouch, A.R. Diamond, J.D. Freeman, S.C. Gunn, R. Kral, H.D. Moore, D.W. Rutland, A.H. Sessler and J.W. Short. While it is richest in specimens from Alabama and the southern United States, the Freeman Herbarium also contains collections from around the country and from many continents in the world. Growth and diversification of the Freeman Herbarium are continuing through open gift and exchange programs and fieldwork.

TYPE SPECIMENS

Currently, the Freeman Herbarium contains over 60,000 mounted vascular plants, of which 26 are documented as types either through citation in original literature or as annotated by a later researcher. This list includes 2 holotypes, 23 isotypes, 1 isoneotype and is arranged alphabetically by family, then by genus. The majority of type specimens are found in Trilliaceae (8) and Asteraceae (7). The reference citation, location (restricted to country, state and county, or equivalent), date, collector, collector number, AUA accession number, and the holotype location, if known, is documented for each specimen.

CATALOGUE OF TYPE SPECIMENS

ARISTOLOCHIACEAE

- Hexastylis shuttleworthii** (Britten & Baker)
Small var. **harperi** Gaddy, ISOTYPE. *Sida* 12:54.
1987. USA. Georgia. Madison Co.: 9 May 1986,
Gaddy s.n. AUA 60732. (HOLOTYPE: CLEMS).

ASTERACEAE

- Coreopsis grandiflora** Hogg ex Sweet var.
inclinata J. Allison, ISOTYPE. *Castanea* 66:162.
2001. USA. ALABAMA. BIBB Co.: 15 Jul 1999, *Allison 12086*. AUA 61466. (HOLOTYPE: US).
- Erigeron strigosus** Muhl. ex Willd. var.
dolomitica J. Allison, ISOTYPE. *Castanea* 66:169.
2001. USA. ALABAMA. BIBB Co.: 10 Jun 2000, *Allison 12396*. AUA 61464. (HOLOTYPE: NY).
- Liatris × freemaniana** J. Allison, HOLOTYPE. *Castanea* 66:179. 2001. USA. ALABAMA. BIBB Co.: 18 Jul 1993, *Allison and Stevens 7804*. AUA 61463.
- Liatris × macdanieliana** J. Allison, ISOTYPE. *Castanea* 66:180. 2001. USA. ALABAMA. BIBB Co.: 20 Aug 1994, *Allison 8559*. AUA 61462. (HOLOTYPE: US).
- Liatris oligocephala** J. Allison, ISOTYPE. *Castanea* 66:175. 2001. USA. ALABAMA. BIBB Co.: 18 Jul 1993, *Allison and Stevens 7802*. AUA 61461. (HOLOTYPE: GH).

- Silphium glutinosum** J. Allison, ISOTYPE. *Castanea* 66:183. 2001. USA. ALABAMA. BIBB Co.: 19 Aug 2000, *Allison 12503*. AUA 61459. (HOLOTYPE: GH).

- Silphium perplexum** J. Allison, ISOTYPE. *Castanea* 66:188. 2001. USA. ALABAMA. DALLAS Co.: 18 Aug 1999, *Allison 12153*. AUA 61458. (HOLOTYPE: GH).

BORAGINACEAE

- Onosmodium decipiens** J. Allison, ISOTYPE. *Castanea* 66:180. 2001. USA. ALABAMA. BIBB Co.: 1 Nov 1993, *Allison and Stevens 8139*. AUA 61460. (HOLOTYPE: NY).

CYPERACEAE

- Carex cumberlandensis** Naczi, Kral, & Bryson, ISOTYPE. *Sida* 19:994. 2001. USA. ALABAMA. WINSTON Co.: 4 May 1991, *Naczi 2868*. AUA 62540. (HOLOTYPE: DOV).
- Fimbristylis argillicola** Kral, ISOTYPE. *Sida* 4:128. 1971. MEXICO. MICHOACAN. 18 Aug 1965, *Kral 25509*. AUA 16998. (HOLOTYPE: MICH).

FABACEAE

- Dalea cahaba** J. Allison, ISOTYPE. *Castanea* 66:166. 2001. USA. ALABAMA. BIBB Co.: 1 May 1994, *Allison and Stevens 8236*. AUA 61465. (HOLOTYPE: NY).

LAMIACEAE

Scutellaria montana Chapman, ISOTYPE [det. by Robert Kral 1979]. Bot. Gaz. 3:11. 1878. USA. GEORGIA. FLOYD Co.: no date, *Chapman s.n.* AUA 4168.

PORTULACACEAE

Talinum mengesii W. Wolf, HOLOTYPE [det. by Kenneth J. Wurdack 1988]. Amer. Mid. Naturalist 6:153. 1920. USA. ALABAMA. CULLMAN Co.: 9 Aug 1919, *Wolf s.n.* AUA 60731.

RANUNCULACEAE

Clematis morefieldii Kral, ISOTYPE. Annals Missouri Bot. Gard. 74:665. 1987. USA. ALABAMA. MADISON Co.: 17 Jun 1983, *Kral 70176*. AUA 45730. (HOLOTYPE: MO).

SCROPHULARIACEAE

Castilleja kraliana J. Allison, ISOTYPE. Castanea 66:159. 2001. USA. ALABAMA. BIBB Co.: 15 Apr 1998, *Allison 10466*. AUA 61467. (HOLOTYPE: NY).

TRILLIACEAE

Trillium albidum J.D. Freeman, ISOTYPE. Brittonia 27:48. 1975. USA. OREGON. JOSEPHINE Co.: 9 May 1967, *Freeman 596 with Freeman*. AUA 56829. (HOLOTYPE: GH).

Trillium channellii I. Fukuda, J.D. Freeman & M. Ito, ISOTYPE. Novon 6:164. 1996. JAPAN. HOKKAIDO. KUSHIRO DIST.: 21 May 1994, *Fukuda and Ito s.n.* AUA 57091. (HOLOTYPE: MAK).

Trillium cuneatum Raf., ISONEOTYPE. Brittonia 27:34. 1975. USA. NORTH CAROLINA. BUNCOMBE Co.:

13 Apr 1966, *Kral 26254*. AUA 21765. (NEOTYPE: GH).

Trillium decipiens J.D. Freeman, ISOTYPE. Brittonia 27:17. 1975. USA. GEORGIA. EARLY Co.: 28 Mar 1968, *Freeman 615 with Murrell, Ihara & Ihara*. AUA 56759. (HOLOTYPE: GH).

Trillium foetidissimum J.D. Freeman, ISOTYPE. Brittonia 27:31. 1975. USA. MISSISSIPPI. ADAMS Co.: 30 Mar 1967, *Freeman 535 with Murrell & Ihara*. AUA 16713. (HOLOTYPE: GH).

Trillium gracile J.D. Freeman, ISOTYPE. Sida 3:289. 1969. USA. TEXAS. SABINE Co.: 1 Apr 1966, *Samejima 1039 with Freeman & Channell*. AUA 56878. (HOLOTYPE: GH).

Trillium kurabayashii J.D. Freeman, ISOTYPE. Brittonia 27:56. 1975. USA. CALIFORNIA. DEL NORTE Co.: 8 May 1967, *Freeman 594 with Freeman*. AUA 56822. (HOLOTYPE: GH).

Trillium maculatum Raf. f. **simulans** J.D. Freeman, ISOTYPE. Brittonia 27:29. 1975. USA. SOUTH CAROLINA. DORCHESTER Co.: 10 Apr 1966, *Freeman 451a with Freeman*. AUA 56864. (HOLOTYPE: VDB).

Trillium reliquum J.D. Freeman, ISOTYPE. Brittonia 27:21. 1975. USA. GEORGIA. RICHMOND Co.: 20 Mar 1968, *Freeman 625 with Murrell, Ihara & Ihara*. AUA 56862. (HOLOTYPE: GH).

XYRIDACEAE

Xyris tennesseensis Kral, ISOTYPE. Rhodora 80:444. 1978. USA. TENNESSEE. LEWIS Co.: 26 Aug 1969, *Kral 36370*. AUA 32229. (HOLOTYPE: US).

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